

1 What is claimed is:

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3 1. An integrated glass ceramic system for providing internal  
4 communications, comprising,

5 a plurality of glass ceramic components, one of the glass  
6 ceramic components being a patterned component made of a  
7 photostructurable glass ceramic material, the glass ceramic  
8 components are coupled together for forming a support  
9 structure,

10 operational devices supported by the support structure,  
11 two of the operational devices are optical devices for  
12 communicating an optical signal through one of the glass  
13 ceramic material components providing an optical path along  
14 which is communicated the optical signal, two of the  
15 operational devices are electronic devices for communicating an  
16 electrical signal through one of the glass ceramic material  
17 components providing an electrical path along which is  
18 communicated the electrical signal, and

19 an optoelectronic communications grid enabling  
20 intercommunications of the electrical signal between the two  
21 electronic devices along the electrical path and enabling  
22 intercommunications of the optical signal along the optical  
23 path and between the two optical devices.

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1   2. The system of claim 1 wherein,  
2       the operational devices are selected from the group  
3       consisting of electronic and electrical and photonic and  
4       fluidic and microelectromechanical systems devices.

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6   3. The system of claim 1 wherein,  
7       the electrooptical communications grid comprises an  
8       electronic and electrical communications grid and an optical  
9       communications grid, the optical communications grid comprising  
10      a free-space optical communication path through one of the  
11      glass ceramic materials.

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13   4. The system of claim 1 wherein,  
14       the patterned components are direct-write laser milled  
15       components, photolithographic exposed and baked and etched  
16       components, and direct-write laser exposed and baked and etched  
17       components.

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19   5. The system of claim 1 wherein,  
20       the operational devices comprise photonic devices for  
21       communicating optical signals through the optical  
22       communications path.

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1       6. The system of claim 1 wherein,  
2           the operational devices comprise photonic devices for  
3       communicating optical signals through the optical  
4       communications path, the photonic devices selected from the  
5       group consisting of optical transceivers and optical  
6       transmitters and optical receivers and optical detectors and  
7       mirrors and splitters and reflectors, polarizers and lenses and  
8       optical fibers.

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10      7. The system of claim 1 wherein,  
11           one of the glass ceramic components is a molded component.

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13      8. The system of claim 1 wherein,  
14           one of the glass ceramic components is an annealed  
15       component.

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17      9. The system of claim 1 wherein,  
18           one of the glass ceramic material components is a tempered  
19       component.

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1 10. An integrated glass ceramic system for providing internal  
2 communications, comprising,

3 a molded component made of a photostructurable glass  
4 ceramic material,

5 a patterned component made of a photostructurable glass  
6 ceramic material, the molded component and patterned component  
7 are coupled together for forming at least part of a support  
8 structure,

9 electrodevices encapsulated within and supported by the  
10 support structure,

11 optodevices encapsulated within and supported by the  
12 support structure, and

13 an electrical communications grid for enabling  
14 intercommunications between the electrodevices devices, and

15 an optical communications grid for enabling optical  
16 intercommunications between the optodevices.

18 11. The system of claim 10 wherein

19 the electrodevices are selected from the group consisting  
20 of electronic, electrical and microelectromechanical systems  
21 devices,

22 the optodevices are elected from the group consisting of  
23 optical transceivers and optical transmitters and optical  
24 receivers and optical detectors and mirrors and splitters and  
25 reflectors and polarizers and lenses and optical fibers.

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1 12. The system of claim 10 wherein,  
2 the support structure provides an optical path within the  
3 optical communications grid.

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5 13. The system of claim 10 wherein,  
6 the support structure defines a housing encapsulating the  
7 electrodevices and optodevices.

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9 14. An integrated glass ceramic system for providing internal  
10 communications, comprising,

11 patterned components made of a photostructurable glass  
12 ceramic material, the patterned component are coupled together  
13 for forming a support structure, one of the patterned  
14 components is a molded patterned components, one of the  
15 patterned components is a tempered patterned component,

16 electrodevices encapsulated within and supported by the  
17 support structure,

18 optodevices encapsulated within and supported by the  
19 support structure,

20 an electrical communications grid for enabling  
21 intercommunications between the electrodevices devices, and

22 an optical communications grid for enabling optical  
23 intercommunications between the optodevices and for enabling  
24 the external communications, one of the components provides an  
25 optical path within the optical communications grid.

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1 15. The system of claim 14, wherein  
2 the electrodevices and optodevices comprise a sensor.

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4 16. The system of claim 14, wherein  
5 the support structure defines a housing encapsulating the  
6 electrodevices and optodevices.

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8 17. The system of claim 14, wherein,  
9 the support structure defines a housing and provides an  
10 optical communications path for enabling the external  
11 communications.

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13 18. The system the claim 14 wherein,  
14 the optical communications grid comprises a free-space path  
15 through one of the patterned components.

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17 19. The system of claim 14 wherein,  
18 the electrical communications grid comprising a conducting  
19 feedthrough path through one of the patterned components.

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